

IN THE CLAIMS:

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1. (Currently Amended): A method for performing user controllable autotuning of a PID controller, the method comprising:

receiving user input indicating a desired characteristic of a PID controller autotuning algorithm;

configuring the PID controller autotuning algorithm in response to the user input indicating the desired characteristic, wherein said configuring produces a configured PID controller autotuning algorithm;

executing the configured PID controller autotuning algorithm to tune the PID controller;

wherein the user input indicating the desired characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.

2. (Original): The method of claim 1,  
wherein the PID controller autotuning algorithm executes according to the desired characteristic specified by the user.

3-4. (Cancelled)

5. (Currently Amended): The method of claim 1, further comprising:  
displaying a graphical user interface on a display device, wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired characteristic of the PID controller autotuning algorithm;  
~~wherein said receiving user input comprises the one or more user input controls receiving the user input.~~

6. (Original): The method of claim 5,  
wherein the one or more user input controls comprise one or more slider controls.

7. (Original): The method of claim 5,  
wherein the one or more user input controls comprise one or more data fields;  
wherein the one or more data fields are operable to receive respective parameter values  
indicating the desired characteristic of the PID controller autotuning algorithm.

8. (Original): The method of claim 1,  
wherein the user input comprises one or more parameter values indicating the  
desired characteristic of the PID controller autotuning algorithm; and  
wherein said configuring the PID controller autotuning algorithm comprises  
applying the one or more parameter values to parameters of the PID controller autotuning  
algorithm.

9. (Currently Amended): The method of claim 1, further comprising:  
displaying a command line interface on a display device, wherein the command  
line interface is operable to receive the user input indicating the desired characteristic of  
the PID controller autotuning algorithm;  
~~wherein said receiving user input comprises the command line interface receiving  
the user input.~~

10. (Currently Amended): The method of claim 1,  
wherein the user input determines a value d, wherein the value d indicates the  
desired characteristic of the PID controller autotuning algorithm; and  
wherein said configuring the PID controller autotuning algorithm comprises  
applying the value d to modified Ziegler-Nichols equations:  
$$P = 0.7 * K_{max}, \text{ where } K_{max} \text{ is a value of } P \text{ at a point of instability;}$$
$$I = P / (0.5 * T) \text{ where } T \text{ is the time corresponding to } f_o, \text{ where } f_o \text{ is a frequency}$$
of oscillation;  
$$D = (1 * d + 5) * P * 0.125 * T \text{ where } d \text{ specifies the control characteristic; and}$$
$$T_d = 5 * d + 1 \text{ where } T_d \text{ is a derivative sample period.}$$

11. (Original): The method of claim 1,

wherein the user input comprises a user-drawn step response curve, wherein the step response curve is displayed on a graphical user interface on a display device, and wherein the method further comprises:

deriving one or more parameter values indicating the desired characteristic of the PID controller autotuning algorithm from the user-drawn response curve;

wherein said configuring the PID controller autotuning algorithm comprises applying the one or more parameter values to parameters of the PID controller autotuning algorithm.

12. (Currently Amended): A computer system for performing user controllable autotuning of a PID controller, the computer system comprising:

a processor;

a memory medium coupled to the processor, wherein the memory medium stores:

a PID controller autotuning algorithm; and

a software program operable to configure the PID controller autotuning algorithm in response to user input;

an input device which is operable to receive user input indicating a desired characteristic of the PID controller autotuning algorithm;

wherein the software program is operable to configure the PID controller autotuning algorithm in response to the user input indicating the desired characteristic, wherein said configuring produces a configured PID controller autotuning algorithm;

wherein the processor is operable to execute the configured PID controller autotuning algorithm to tune the PID controller; and

wherein the user input indicating the desired characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.

13. (Original): The computer system of claim 12, further comprising:

a display device coupled to the processor, wherein the display device is operable to display a user interface which is operable to receive the user input indicating a desired characteristic of a PID controller autotuning algorithm.

14. (Currently Amended): The computer system of claim 13,  
wherein the user interface comprises a graphical user interface, wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired characteristic of the PID controller autotuning algorithm; and

~~wherein said receiving user input comprises the one or more user input controls receiving the user input.~~

15. (Original): The computer system of claim 14,  
wherein the one or more user input controls comprise one or more slider controls.

16. (Original): The computer system of claim 13,  
wherein the user interface comprises a command line interface, wherein the command line interface is operable to receive the user input indicating the desired characteristic of the PID controller autotuning algorithm.

17. (Currently Amended): The computer system of claim 12,  
wherein the PID controller autotuning algorithm is executable according to the desired characteristic specified by the user; and  
~~wherein the user input indicating the desired characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm.~~

18. (Cancelled)

19. (Currently Amended): A memory medium comprising program instructions,  
wherein the program instructions are computer-executable to perform:  
receiving user input indicating a desired characteristic of a PID controller autotuning algorithm;

configuring the PID controller autotuning algorithm in response to the user input indicating the desired characteristic, wherein said configuring produces a configured PID controller autotuning algorithm;

executing the configured PID controller autotuning algorithm to tune the PID controller;

wherein the user input indicating the desired characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.

20. (Original): The memory medium of claim 19,  
wherein the PID controller autotuning algorithm executes according to the desired characteristic specified by the user.

21-22 (Cancelled)

23. (Currently Amended): The memory medium of claim 19, further comprising:  
displaying a graphical user interface on a display device, wherein the graphical user interface includes one or more user input controls which are operable to receive the user input indicating the desired characteristic of the PID controller autotuning algorithm;  
~~wherein said receiving user input comprises the one or more user input controls receiving the user input.~~

24. (Original): The memory medium of claim 23,  
wherein the user input comprises one or more parameter values indicating the desired characteristic of the PID controller autotuning algorithm; and  
wherein said configuring the PID controller autotuning algorithm comprises applying the one or more parameter values to parameters of the PID controller autotuning algorithm.

25. (Currently Amended): A graphical user interface displayed on a display device, wherein the graphical user interface includes:

one or more user input controls displayed in the graphical user interface which are operable to receive user input indicating a desired characteristic of a PID controller autotuning algorithm;

wherein the user input indicating the desired characteristic of the PID controller autotuning algorithm is operable to be used in configuring the PID controller autotuning algorithm, wherein the user input indicating the desired characteristic indicates a desired operation of the PID controller after execution of the autotuning algorithm, and wherein the desired operation includes one or more of stiffness and response time.

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